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# **Some Studies On Probiotics On Humoral And Cellular Immunity In Poultry**

**A thesis presented by**

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**(Bachelor Degree of Veterinary Sciences, 2003)**

**For the Master Degree in Veterinary Medical Sciences**

**Microbiology**

**(Bacteriology, Immunology and Mycology)**

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**(2015)**

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

قَالُوا سُبْحَانَكَ لَا عِلْمَ لَنَا إِلَّا مَا

عَلَّمْتَنَا إِنَّكَ أَنْتَ الْعَلِيمُ الْحَكِيمُ

صَدَقَ اللَّهُ الْعَظِيمُ

سورة البقرة - الآية 32

# **Supervision sheet**

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### **Abstract**

This study aimed to investigate the immuno-modulatory effect of a commercial probiotic (**Bactocell**)<sup>®</sup> in broiler chickens through investigating the relationship between in vitro phagocytosis by monocyte macrophage with in vivo pathogen clearance and antibody production which providing a new parameter to improve disease resistance in poultry .

A total number of 260 one day old SASSO chicks were divided into 2 experiment in the study experiment I a total of 160 one day broiler chickens were divided into 4 equal groups G (1) chickens served as negative control G (2) chickens were fed on commercial ration supplemented with probiotic (Bactocell) 1 Kg / ton G (3) chickens were fed on commercial ration supplemented with probiotic (**Bactocell**)<sup>®</sup> 1 Kg / ton and vaccinated with NDV and inactivated H5N1 Avian influenza ( AI ) vaccines G (4) chickens were vaccinated with NDV and inactivated H5N1 Avian influenza (AI) vaccine. Experiment II was conducted to evaluate the impact effect of probiotic in chickens experimentally infected with *S. Enteritidis* a total of 100 chickens of 29 days of age were divided into 4 equal groups G (A) chickens served as negative control G (B) chickens were fed on commercial ration supplemented with probiotic (Bactocell) 1 Kg / ton G (C) chickens infected with *S. Enteritidis* orally at 29 day of age in a single dose ( $10^8$  CFU /ml) in

0.2 ml phosphate buffer saline G (D) chickens fed on commercial ration supplemented with probiotic and infected with *S. Enteritidis*. The results showed that probiotics supplementation stimulate both humoral and innate immune response. Chickens supplemented with probiotic & vaccinated (G3) showed significant increase in HI titers against NDV at 5<sup>th</sup> weeks compared to vaccinated chickens and were higher in HI titers against (AI) at 21 days post-vaccination among groups. Lysozyme activity revealed significant increase in probiotic chickens versus non treated ones at 1<sup>st</sup> and 5<sup>th</sup> weeks of age. Chicken supplemented with probiotic (G2) showed significant increase in phagocytic % of macrophage at 1<sup>st</sup>, 2<sup>nd</sup> and 5<sup>th</sup> weeks, also phagocytic index at 1<sup>st</sup>, 2<sup>nd</sup>, 5<sup>th</sup> weeks compared to control. Chicken infected with *S. Enteritidis* (G) C showed significant decrease in phagocytic % and index at 7, 14 and 21 days post infection compared with control (G) A, while chickens supplemented with probiotic & infected with *Salmonella* (G) D showed significant increase phagocytic % and phagocytic index at 7 and 21 days post infection compared to *S. Enteritidis* group (G) C. Interdigital skin test showed non-significant change in experiment I among groups while in experiment II chickens supplemented with probiotic (G) B showed significant increase in skin thickness at 24 hr. compared to chickens infected with *S. Enteritidis* (G) C. Protection rate against challenge with NDV reached 90 % in chickens supplemented with probiotic & vaccinated while chickens vaccinated only revealed 60 % protection rate. It was concluded that probiotic (**Bactocell**)® proved to be able implement humoral and innate immune response and have a potent immuno-modulatory effect in chickens beside another effect in inhibition or reduction of *S. Enteritidis* count in infected poultry.

**Key words** :( probiotics- chickens- humoral immunity- cellular immunity- *Salmonella*).

*Dedication to*

*My mother,*

*My father,*

*My beloved husband*

*Shereif,*

*My children*

*&*

*My brothers and my sister*

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